

Study of Chemical compounds on the Surface of Ice

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The cryosphere accommodates a rich variety of chemical compounds, either those naturally occurring or anthropogenic imported via long-range transport. Natural ice and snow is a huge environmental reactor facilitating (photo-)chemical transformations of these compounds.[1-3] Despite the effort of scientific community,[2] many questions remain opened.[4] The obtained results are sometimes contradictory, which can be exemplified on the observed rates of photo-degradation of impurities (e. g. benzene) on ice.[5, 6] The shift of the absorption spectrum of benzene (from UV to visible region) was suggested to explain an increase in the rate of photolysis of benzene on ice. In our research, the laboratory-based experiments were performed to answer two conflicting problems: possible spectral shift of organic compounds at ice surfaces, and the extent of aggregation. We apply photo physical spectroscopic methods and environmental scanning electron microscopy (ESEM) to investigate the model ice-impurities systems. In my talk, I will present the results of our most recent research into the ice impurities segregation, excimer formation and energy transfer in frozen environments.[7-10] The implications for environmental ices will be drawn.

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